IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Application No.: | 10/009,473 | Group Art No.: | 1648 |
| Filed: | November 8, 2001 | Examiner: | Emily M. Le |
| Applicant: | Michael Hagen | | |
| Confirmation No.: | 3152 | | |
| Customer Number: | 25291 | | |
| Docket Number: | ACY33482 | | |
| Title: | ADJUVANT COMBINATION FORMULATIONS | | |

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R § 1.132**

Sir:

I, Michael Hagen, hereby declare and state that:

1. I am a Senior Director in the Vaccine Research Department at Wyeth Research. I have been employed at Wyeth for 12 years. I have a Ph.D degree in Microbiology and Immunology from the University of Western Ontario in London, Ontario, Canada. My full curriculum vitae is attached as Exhibit A.

2. My principal areas of research are Immunology and Vaccine Discovery Research. I have been a key participant in advancing two programs through drug development and four vaccines through clinical trials. I am an author on 26 publications, 3 book chapters and 26 meeting presentations/abstracts in the general field of Immunology and vaccine research.

3. In the course of my activities, I have been listed as inventor on several patent applications, including the one noted above entitled "Adjuvant Combination Formulations", application number 10/009,473, which entered the national stage based on PCT/US00/13156, filed on May 12, 2000, which claimed priority to US provisional application number 60/133963, filed on May 13, 1999.

4. I have reviewed the present patent application, the pending claims and the current office action dated March 19, 2008. Based on what was known prior to May 13, 1999, it is my opinion that a Ph.D scientist in the field of Immunology would not have been able to predict that the combination of a 3-0-deacetylated monophosphoryl lipid A or monophosphoryl lipid A with granulocyte macrophage colony stimulating factor (GM-CSF), together with a diluent or carrier and the HIV antigen of the claimed invention would have provided an effective immune response. Furthermore, one skilled in the field would not have been able to predict the nature of the interaction of the individual components of the claimed invention as asserted by the Examiner when citing particular references, particularly Ulrich et al.(Vaccine Design, Plenum Press, New York, N.Y., pages 495-523), Disis et al. (Blood, 1996, Vol. 88, No.1: 202-210) and Bartlett et al (AIDS 1998, Vol.12, No. 11)..

5. It is my understanding that the Examiner is of the belief that at the time of filing of the present application, the combination of any two or more immunomodulators, whether cytokines or adjuvants or a combination of a cytokine and an adjuvant, would predictably provide a synergistic response when added to any particular antigen. The Examiner appears to be of the belief that, at the time of filing the present application, it could have been predicted that the combination any of immunomodulator(s) with any antigen would induce a CTL response.

6. Contrary to the Examiner's belief, in my opinion, a person of ordinary skill in the field of vaccine sciences would not have been able to predict that any particular HIV peptide in combination with any adjuvant and any cytokine would have yielded a predictable immune response.

7. Additionally, it is my opinion, that a cytokine (or lymphokine) and an adjuvant are not "art recognized equivalents". I strongly disagree with the Examiner's comments that the skilled artisan would have had a reasonable expectation of success in combining the two adjuvants, GM-CSF and MPL based on the Examiner's belief that these two elements are "art recognized equivalents". A trained Immunologist would immediately understand that there is no reasonable expectation of success in combining an adjuvant and a cytokine or lymphokine with an antigen of interest primarily due to the mechanism of action of each of these classes of molecules. An

adjuvant and a cytokine are completely different classes of immunomodulators. There is nothing predictable about their activities in combination.

Adjuvants and cytokines have inherently different mechanisms of action and, in my opinion, would not be considered as equivalents. An adjuvant works through the stimulation of a general immune response and can activate one or many different cytokines or chemokines during its course of action. Every cytokine or chemokine individually stimulates different pathways within the immune system. All of these pathways are different and every response by the immune system is different based on the adjuvant(s) used and the antigen administered with it. Cytokines, when administered to a subject, stimulate only one pathway. During the combination of an adjuvant and a cytokine, because of the different pathways involved, the immune response is unpredictable regardless of the individual mechanisms of action of the adjuvant and the cytokine. The other variable is the antigen itself. The administration of different antigens will yield a different immune response based on the individual properties of that particular antigen. The immune response generated from the combination of an antigen and an adjuvant and/or a cytokine is, again, unpredictable. There is no way in advance of knowing what will work until the appropriate experiment is completed.

The HIV peptide reference, Bartlett et al., refers to a peptide similar to the peptide used in the present application. Our data in the application, shows that the CTL and antibody responses are not inherently stimulated in animals using these CTL/Th epitope-containing peptides, even in the presence of cytokine or adjuvant alone. It is the combination that is unique. These formulations were devised and evaluated because of poor immune responses and an unacceptable safety profile using a different adjuvant.

In conclusion, it is in my opinion that the Examiner's assertion that the combination of MPL and GM-CSF with the HIV peptide of the claimed invention, is obvious to combine is incorrect based on the statements set forth above.

8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, or imprisonment, or both under Title 18 of the U.S. Code, Section 1001, and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Dated: 17-Sep-2008

Michael Hagen, Ph.D

# *EXHIBIT A*

## Curriculum Vitae

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| **Name:** | Michael Hagen |
| **Address:** | 12 Summit Oaks, Pittsford, NY, 14534 |
| **Telephone:** | (585) 381-0417 (home)<br>(845) 602-3023 (work) |
| **Citizenship:** | Canada / United States of America (dual) |
| **Languages:** | English / German (fluent) |

**Education:**

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| Post Doc | University of Iowa, College of Medicine, Department of Pathology, Laboratory of Experimental Immunology, Iowa City, IA (Lab head- Dr. R.G. Lynch). |
| Ph.D. | University of Western Ontario, London, Ontario, Canada. Department of Microbiology and Immunology. (1989) (Dr. G.H. Strejan mentor). |
| M.Sc. | University of Toronto, Toronto, Ontario, Canada. Department of Zoology. (1983) (Dr. M.F. Filosa and Dr. J.H. Youson mentors). |
| B.Sc. (1979). | University of Toronto, Toronto, Ontario, Canada. Biology/Psychology. |

**Employment History:**

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| 2005 – present | Senior Director, Wyeth Vaccines Research and Development, Early Phase Programs Immunology, Wyeth Research. |
| 2003 - 2005 | Director, Vaccines Discovery (Immunobiology), Wyeth Research. |
| 2002 - 2003 | Associate Director, Bacterial Vaccine Immunology, Wyeth Research. |
| 2002 | Principal Research Scientist II, Immunology, Wyeth Vaccines Research. |

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| 1999 - 2001 | Principal Research Scientist I, Immunology, Wyeth Vaccines Research. |
| 1998 - 1999 | Senior Research Scientist I, Immunology, Wyeth-Lederle Vaccines. |
| 1996 – 1998 | Research Scientist III, Immunology, Wyeth-Lederle Vaccines and Pediatrics. |

**Research/Managerial Experience:**

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| 2007 - present | Wyeth Vaccines Licensing and New Business Council member. |
| 2007 | Selected for Wyeth Executive Leadership Program I. |
| 2007 | Selected for Wyeth Drug Development Training Program's I and II. |
| 2006 – present | Wyeth Learn Team member – Elan AD Alliance. |
| 2005 - 2007 | Research Team Leader, Novel Adjuvants and Vaccine Delivery Technology. |
| 2003 - 2006 | Discovered and advanced through Development Alzheimer's Immunotherapeutic backup candidate. |
| 2003 - present | Research Team Leader, Chlamydia Discovery/Research team. |
| 1999 - present | Research Team Leader: Wyeth/Elan Alzheimer Immunotherapy Collaboration. |
| 1998 - 2002 | Lead Immunologist, Chlamydia Discovery/Research team. |
| 1996 - 1998 | Lead Immunologist, Neisseria gonorrhea Research team. |
| 1992 - 1994 | Lab-advisor; Post Doctoral M.D. Fellow. University of Iowa, College of Medicine, Laboratory of Experimental Immunology, Iowa City, IA. |
| 1991 - 1995 | Lab-advisor; 2 PhD graduate students, two senior undergraduate students. University of Iowa, College of Medicine, Laboratory of Experimental Immunology, Iowa City, IA. |
| 1989 | Senior Technical Associate, Department of Microbiology and Immunology University of Western Ontario, London, Ontario, Canada. |
| 1986 - 1989 | Lecturer & Laboratory Instructor; Molecular Immunology, University of Western Ontario, London, Ontario, Canada. |

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| 1983 - 1986 | Lecturer & Laboratory Instructor; Developmental and Comparative Morphology, University of Toronto/Scarborough College, Toronto, Ontario, Canada. |
| 1983 - 1986 | Laboratory Instructor; Developmental and Comparative Histology, University of Toronto/Scarborough College, Toronto, Ontario, Canada. |

**Honors, academic awards, and other relevant achievements:**

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| 2008 - present | Member NYAS Vaccines Steering Committee. |
| 2008 | Organized/hosted NYAS symposia "Vaccines for Neurodegenerative Diseases." |
| 2007 | Wyeth "CNS Pipeline Award" Team member. |
| 2005 | Wyeth Team of the Year Award: "ACC-001 Joint Project Team." |
| 2005 | Wyeth Team of the Year Award: "Alzheimer's Disease Amyloid Programs Team." |
| 2000 | Wyeth-Ayerst "Above and Beyond Award" for contributions to AD program. |
| 1999 | WLV "GMP Excellence Award" – GC project. |
| 1989 | Canadian Society of Immunology International Travel Bursary (Berlin). |
| 1987 - 1988 | University of Western Ontario University Studentship. |
| 1985 - 1987 | Medical Research Council of Canada Studentship. |
| 1983 - 1984 | University of Western Ontario University Studentship. |
| 1982 | University of Toronto Open Scholarship. |
| 1981 | Natural Science and Engineering Research Council of Canada - Pure and Applied Science Research Grant. |
| 1979 | Canadian Cystic Fibrosis Foundation Student Scholarship. |
| 1978 | Ontario Ministry of Energy Research Training Grant. |
| 1975 | Province of Ontario Scholarship. |

**Expertise and Experiences:**

Vaccine/antibody research and development specific to bacteriology, virology and non-infectious disease. Responsible for animal (including non-human primate) study design and execution. Additionally, head group responsible for Immunological Assay development and qualification. Also responsible for authoring and preparation of documents including study reports, INDs, patent and regulatory filings, and review of aforementioned documentation prepared by other groups. A key participant in advancing 2 programs through Development Track, and 4 Vaccines in Clinical Trial. Have functioned as liason between Wyeth Vaccines and various corporate and academic partners, and collaborators. Interacted with FDA (CBER and CDER) and EU regulatory agencies, and European patent court. Have managed active research and development group having as many as 33 FTE. Evaluated outside licensing opportunities and collaborations. Presentation of research and development strategies to Wyeth Vaccines and Wyeth Research senior/executive management. Have had extensive formal training in Executive Leadership skills, Drug Development, Management, and a variety of Human Resource specific topics.

**Ad Hoc Reviewer:**

Journal of Immunological Methods (2000 – 2001).

FASEB Journal (2000 - 2001).

Journal of Immunology (1994 - 1996).

**Professional Society Memberships:**

American Association of Immunologists (1989 – present).

New York Academy of Sciences (2004 – present).

**Publications:**

1. Hagen, M., Filosa, M.F., and J.H. Youson (1983). Immunocytochemical localization of antibody-producing cells in adult Lamprey. *Immunology Letters*. 6(2), 87-92.
2. Hagen, M., Filosa, M.F., and J.H. Youson (1985). The immune response in adult Sea Lamprey (Petromyzon marinus L.): The effects of temperature. *Comparative Biochemistry and Physiology*. 82(1), 207-210.



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3. Hagen, M. and G.H. Strejan (1987). Antigen leakage from Immunosorbents. Implications for the detection of site-directed auto-anti-idiotypic antibodies. *Journal of Immunological Methods*. 100(1-2), 47-57.

4. Hagen, M., Essani, N.A., and G.H. Strejan (1989). Role of Interferon-gamma in the modulation of the IgE response by dinitrophenyl-Bordetella pertussis vaccine in the mouse. *European Journal of Immunology*. 19(3), 441-446.

5. Hagen, M., Morrison, B., Robbinson, D. and G.H. Strejan (1992). Effect of Anti-DNP IgG1- and IgG2a-secreting hybridomas in vivo on the development of an anti-DNP IgE antibody response in mice. *International Archives of Allergy and Applied Immunology*. 97(2), 146-153.

6. Lynch, R.G., Sandor, M., Mathur, A., Nunez, R., Hagen, M., Waldschmidt, T., Van Ness, B., Nelms, D., Noben, N.N., Ibraghimov, A., Mordue, D., Sacco, R., Teeraratkul, K., Schaiff, W. and L. Jakubov (1992). Lymphocyte Fc receptors: The immunobiology and pathology of CD23. *Immunobiology*. 185(2-4), 235-267.

7. Sandor, M., Hagen, M. and R.G. Lynch (1994). Methods for studying Fc receptor expression. *Immunomethods*. 4(1), 4-16.

8. Sacco, R.E., Hagen M., Donelson J.E. and R.G. Lynch (1994). B lymphocytes of mice infected with Trypanosoma brucei display an aberrant activation phenotype and are cell cycle arrested in $G_0/G_{1A}$. *Journal of Immunology*. 153(4), 1714-1723.

9. Hagen, M., Sandor, M. and R.G. Lynch (1995). Developmental regulation of Fc□RII/CD23 expression in B-lineage cells: Evidence for transcriptional and post-transcriptional levels of control. *Immunology Letters.* 44(2-3), 157-162.

10. Nambu, M., Hagen, M., Sandor, M., Sacco, R.E., Kwack, K-B. and R.G. Lynch (1995). Regulation of CD23 expression on CD23-transfected CD4+ T cell clone. *Immunology Letters.* 44(2-3), 163-167.

11. Lynch, R.G., Hagen, M., Mueller, A. and M. Sandor (1995). Potential role of Fc□R in early development of murine lymphoid cells: Evidence for functional interaction between Fc□R on pre-thymocytes and an alternative, non-Ig ligand on thymic stromal cells. *Immunology Letters.* 44(2-3), 105-109.

12. Kwack, K-B., Verbeek, S., van de Winkel, J., Cappel, P., Nambu, M., Hagen, M., Weinstock, J.V., Lynch, R.G. and M. Sandor (1995). The interaction of T cell antigen receptor and Fc□R on T lymphocytes. *Immunology Letters.* 44(2-3), 139-143.

13. Hagen, M., Sacco, R., Nambu, M., Best, C., Sandor, M. and R.G. Lynch (1995). The Fc□RII/CD23 gene is actively transcribed during all stages of murine B-lymphocyte development. *Molecular Immunology.* 32(16), 1245-1257.

14. Sandor, M., Hagen, M., de Andres, B. and R.G. Lynch (1996). Developmentally regulated Fc□ receptor expression in lymphopoiesis: Fc□RIII (CD16) provides an ITAM motif for pro-T and pro-B cells. *Immunology Letters.* 54(2-3), 123-127.

15. Rakasz, E., Sandor, M., Hagen, M. and R.G. Lynch (1996). Activation features of intraepithelial lymphocytes of murine vagina. *Immunology Letters.* 54(2-3), 129-134.

16. Rakasz, E., Hagen, M., Sandor, M. and R.G. Lynch (1997). □□ T cells of the murine vagina: T cell response in vivo in the absence of the expression of CD2 and CD28 molecules. *International Immunology.* 9(1), 161-167.

17. deAndres, B., Rakasz, E., Hagen, M., McCornick, M., Mueller, A., Sandor, M.,Brittigan, B., Weinstock, J. and R.G. Lynch (1997). Lack of Fc□ receptors on murine eosinophils: Implications for the functional significance of elevated IgE and eosinophils in parasitic infections. *Blood.* 89(10), 3826-3836.

18. Rakasz, E., Rigby, S., deAndres, B., Mueller, A., Hagen, M., Dailey, M.O., Sandor, M. and R.G. Lynch (1998). Homing of transgenic gamma delta T cells into murine vaginal epithelium. *International Immunology*. 10(10), 1509-1517.

19. Tebbey, P.W., Hagen, M. and G.E. Hancock (1998). Atypical pulmonary eosinophilia is mediated by a specific amino acid sequence of the attachment (G) protein of respiratory syncytial virus. *Journal of Experimental Medicine.* 188(10), 1967-1972.

20. deAndres, B., Hagen, M., Sandor, M., Verbeek, S., Rokhlin, O. and R.G. Lynch (1999). A regulatory role for Fc□ receptors (CD16 and CD32) in hematopoiesis. *Immunology Letters.* 68(1), 109-113.

21. Liao, Hua-Xin, Cianciolo, G.J., Staats, H.F., Scearce, R.M., Lapple, D.M., Stauffer, S., Thomasch, J.R., Pizzo, S.V., Montefiori, D.C., Hagen, M., Eldridge, J. and B.F. Haynes (2002). Combination of monophosphoryl lipid A and GM-CSF adjuvant with an HIV envelope immunogen coupled to □$_2$-macroglobulin increases HIV envelope subunit immunogenicity. *Vaccine*. 20, 2396-2403.

22. Sacco, R.E., Hagen, M., Sandor, M., Weinstock, J.V. and R.G. Lynch (2002). Established Th1 responses induced by active Mycobacterium avium infection switch to Th2 following challenge with Schistosoma mansoni. *Clinical Immunology*. 104, 274-281.

23. Egan, M.A., Chong, S.Y., Hagen, M., Megati, S., Schadeck, E.B. Masood, A., Piacente, P., Mishkin, E.M., Montefiori, D.C., Haynes, B.F., Eldridge, J.H., Israel, Z.R. and H.F. Staats. (2004). Evaluation of nasal and parenteral vaccine adjuvants for use with HIV-1 peptide immunogens in cynomolgus macques. *Vaccine*. 22, 3774-3788.

24. Schenk, D., Hagen, M. and P. Seubert. (2004). Current progress in beta-amyloid immunotherapy. *Current Opinion in Immunology*. 16(5), 599-606.

25. Cooper, D., Mester, J.C., Guo, M., Nasar, F., Souza, V., Dispoto, S., Sidhu, M., Hagen, M., Eldridge, J., Natuk, R.J. and M.W. Pride. (2006). IL-12 modulates the recognition of a novel HSV-2 glycoprotein D CD4+ CTL epitope located at the transmembrane-cytoplasmic junction. *Cellular Immunology.* 239, 113-120.

26. Pride, M., Seubert, P., Grundman, M., Hagen, M., Eldridge, J. and R.S. Black. (2008). Progress in the Active Immunotherapeutic Approach to Alzheimer's Disease: Clinical Investigations into AN1792-associated Meningoencephalitis. *Neurodegenerative Diseases.* 5:194-196.

**Book Chapters:**

1. Lynch, R.G., Berg, D.J., Mordue, D.G., Sacco, R.E., Nunez, R.M., Hagen, M., Sandor, M., Robinson, M.G. and A.L. Mueller (1991). Host immune dysfunction with plasma cell tumors: TGF-□ levels are increased, the expression of activation receptors on T- and B-lymphocytes is selectively altered, and virgin B-lymphocytes are cell-cycle arrested late in G1. In: *Eurage. Topics in Aging Research in Europe*. V.14. B. Van Camp and J. Radl, Eds., Leiden, p. 83-90.

2. Lynch, R.G., Sandor, M., Nunez, R., Hagen, M., Teeraratkul, K., Noben, N. and R. Sacco (1993). The regulation and functional significance of Fc receptors on murine lymphoid cells: The special case of T cells. In: *Progress in Immunology VIII*. Springer-Verlag, Budapest, p. 443-448.

3. Lynch, R.G., Sacco, R., Hagen, M., Weinstock, J. and Sandor, M. (1994). Activated T lymphocytes in granulomatous inflammation. In: *Current Topics in Mucosal Immunity*, M. Tsuchiya, J. Yoidoi, T. Hibi, S. Miura, Eds. Elsevier, Amsterdam. p. 11-19.

**Meeting Presentations/Abstracts:**

1. Hagen, M., Sandor, M., Latour, S., Daeron, M., and R.G. Lynch. (1994). Developmental restriction of the expression of murine IgG Fc receptors and associated receptor proteins in a panel of B cell lines and lymphomas. *FASEB Journal. 8(5): A980*.
2. Nambu, M., Hagen, M., Sandor, M., Sacco, R., Kimura, M. and R.G. Lynch. (1994). Functional significance of murine Fc□RII (CD23) transfected into a Th2 clone. *FASEB Journal. 8(5): A1015*.
3. Nambu, M., Hagen, M., Sandor, M. and R.G. Lynch. (1994) Regulation of CD23 expression on CD23-transfected CD4+ clone. *Midwest Autumn Immunology Conference*, Chicago, IL. Vol **23**.
4. Hagen, M., Sacco, R. and R.G. Lynch. (1995). The effects of Th1 and Th2 parasitic infection models on the development of immune responses. *9th International Congress of Immunology*. San Francisco.
5. Mordue, D., Hagen, M., and R.G. Lynch. (1995). Spontaneous regression of the subcutaneous MOPC 104E plasmacytoma involves endogenous IFN-gamma and CD8+ T cells. *9th International Congress of Immunology*. San Francisco.
6. Nambu, M., Kwack, K., Hagen, M., Sandor, M. and R.G. Lynch. (1995). Post-transcriptional regulation of CD23 expression by IL-4 and CD23 transfected CD4+ T cell clones. *9th International Congress of Immunology. San Francisco.*
7. deAndres, B., Sandor, M., Hagen, M., Weinstock, J., Lahoz, C. and R.G. Lynch. (1995). Altered expression of IgE binding receptors on murine eosinophils from Schistosoma mansoni granulomas. *9th International Congress of Immunology*. San Francisco.
8. Evans, P.J., Hagen, M., Slightler, H. and J.D. Kemp. (1996). Determining the exon/intron structure of the human transferrin receptor gene. *FASEB Journal. 10(6): A1151*.
9. Rakasz, E., Hagen, M., Sandor, M. and R.G. Lynch. (1996). Murine vaginal □□ T cells: Site dependent expression of activation markers on □□ T cells that express a transgenic TCR. *Keystone Symposia on Lymphocyte Activation*. Hilton Head, SC.
10. Chong, S., Egan, M., Megati, S., Hagen, M., Schadeck, E., Mishkin, E., Staats, H.F., Haynes, B., Eldridge, J. and Z. Israel. (2002). Elicitation of Mucosal Immunity in Cynomolgous Macaques with a HIV-1 Peptide Vaccine: Comparison of routes of immunizations and various adjuvant formulations. *Keystone Symposia on HIV-1 protection and Control by Vaccination*. Breckenridge, CO.
11. Hilchey, S., Carrie T., Metcalf, T. and M. Hagen. (2003). The Development of Murine Challenge Models utilizing the Human *Chlamydia trachomatis* Serovar D for Vaccine

Screening Purposes. *Chlamydia Basic Research Society Biennial and Charter Meeting*. Memphis, TN.

12. Seubert, P., Games, D., Khan, K., Buttini, M., Bard, F., Guido, T., Grajeda, H., Barbour, R., Nguyen, M., Kling, K., Vasquez, N., Schenk, D., Hagen, M. and J. Eldridge. (2003). Comparative Efficacy of Different Immunotherapeutic Approaches in Reducing AD-like Neuropathology. *Society for Neuroscience*. New Orleans, LA.

13. Pride, M. W., Black, R. S., Hagen, M., Dispoto, S., Souza, V., Giorgio, D., Jenkins, L., Johnson-Fenno, L., Ginsberg, R., Daniels, M., Koller, M. and J. Eldridge. (2003). Evaluation of the Cellular Immune Response in AD patients after Immunotherapy with AN1792(QS-21). *Society for Neuroscience. New Orleans, LA.*, and, *9th International Conference on Alzheimer's Disease and Related Disorders*, Philadelphia, PA.

14. Pride, M. W., Black, R.S., Hagen, M., Dispoto, S., Souza, V., Giorgio, D., Zhao, X., Jenkins, L., Johnson-Fennon, L., Ginsberg, R., Daniels, M., Koller, M. and J. Eldridge. (2004). Evaluation of potential immunologic mechanisms in the pathogenesis of treatment-induced meningoencephalitisin Alzheimer's Disease patients treated with AN1792 (QS-21). *Neurobiology of Aging 25(Suppl. 2):S574*.

15. Mester, J., Zhao, J., Souza, v., Quiroz, J., Thakur, A., Hagen, M., Bernstein, D., Fife, K., Eldridge, J. and M. Pride. (2005). Cytokine Profile of the Cell Mediated Immune Response to HSV-2 in Asymptomatic and Symptomatic Human Subjects. *30th International Herpesvirus Workshop (IHW)*, Turku, Finland.

16. Cahill, A., Eldridge, J., Hagen, M., Hamm, S., Hutchinson, A., Kowalski, J., Kulp, L., Laufer, D., Li, J., McElhiney, S., Natuk, R.J., Ota-Setlik, A., Olivier, S., Parks, C., Pullen, J., Udem, S., York, L., Da Silva, D. and W.M. Kast. (2005). Development of a multivalent vaccine for therapeutic immunization against HPV-associated diseases. *22nd International Papillomavirus Conference and Clinical Workshop*, Vancouver, BC., Canada.

17. Li, J.S., Ota-Setlik, A., Coleman, J., Natuk R.J. and M. Hagen (2006). Chlamydia trachomatis Vaccine Development in Murine Challenge Models. *Keystone Symposia, Determinants of Host Resistance, Susceptibility or Immunopathology: Integrating Knowledge from Experimental Models to Human Disease.* Keystone, CO.

18. Jiang H-Q, Alexander K, Tan C, Ongeri V, Mason K, Bentley B, Novikova E, Hagen M, Zhu D, and G. Zlotnick (2006) Induction of serum IgG response by a bivalent recombinant lipoprotein 2086 that provides broad protection against serogroup B Neisseria meningitidis. *International Pathogenic Neisseria Conference*, Cairns, Queensland, Australia.

19. Black, R.S., Grundman, M., Seubert, P.,Hagen, M., Pride, M. and John Eldridge (2007). Progress in the Immunotherapeutic approach to Alzheimer's Disease. [Abstract and Presentation] *Alzheimer's and Parkinson's Diseases: Progress and New Perspectives,* Salzburg, Austria.Lemere, C.A., Rowlett, J.K., Carville, A., Platt, D.M., Licata, S.C., Harper-Castle, S., Westmoreland, S.V., Curran, L., Sun, S., Seubert, P., Johnson-Wood, K., Potter, R., Schenk, D., Games, D., Mansfield, K.G., Hagen, M., Eldridge, J.H., Jacobsen, J.S. and M.N. Pangalos (2007). Active Amyloid-Beta (Aß) Immunization Stabilizes or Improves Cognition in Aged Caribbean Vervets. [Abstract and Presentation] *Molecular Mechanisms of Neurodegeration*. Antigua.

21. Games, D., Jacobsen, S., Pangalos, M., Hagen, M., Gill, D., Schenk D. and P. Seubert (2008). Issues and advances in the development of Immunotherapies for Alzheimer's Disease. *Springfield Pan-Asian Symposium on Advanced in Alzheimer's Therapy.* Hong Kong.

22. Lemere, C.A., Rowlett, J.K., Westmoreland, S.V., Seubert, P., Johnson-Wood, K., Schenk, D., Games, D., Mansfield, K.G., Hagen, M., Eldridge, J.H., Jacobsen, J.S. and M.N. Pangalos (2008). Aß Immunization Reduces Plaques and Stabilizes Cognition in Aged Vervets. [Abstract and Presentation] *Springfield Pan-Asian Symposium on Advanced in Alzheimer's Therapy.* Hong Kong.

23. Dodge, I.L., Olmsted, S., Matsuka, Y., Murphy, E., Douglas, M., Mason, K., Severin, A., Rojas, E., Severina, E., Mack, M., Pawlyk, D., Villa, A., Carriere, M., Fulginiti, J., Dasilva, I., Zhu, D., Zagursky, R., Hagen, M., Jansen, K and Annaliesa Anderson (2008). Piecing it Together: Genomics, Proteomics and Antigen Selection for a Group A Streptococcal Vaccine. *XVII Lancefield International Symposium on the Streptococci and Streptococcal Diseases.* Greece.

24. Lemere, C.A., Rowlett, J.K., Carville, A., Platt, D.M., Licata, S.C., Harper-Castle, S., Westmoreland, S.V., Curran, L., Sun, J., Pepivani, I., Hagen, M., Eldridge, J.H., Jacobsen, J.S., Pangalos, M.N., Seubert, P., Johnson-Wood, K., Motter, R., Schenk, D., Games, D., Mansfield, K.G. (2008). Active Aß Vaccines Stabilize or Improve Cognition and Lower Plaque Burden in Aged Caribbean Vervets. *International Conference on Alzheimer's Disease 2008*. Chicago, IL.

25. Han-Qing Jiang, Shannon L. Harris, Christine Tan, Adrienne Scott, Kristin Alexander, Kathryn Mason, Ida DaSilva, Michelle Mack, Xiao-Juan Zhao, Stephan Guttmann, Daiqing Liu, Phillip Wong, Lisa McNeil, Michael Pride, Ashoni Arora, Duzhang Zhu, Susan Hoiseth, Terri Mininni, Michael Hagen, Thomas Jones, Kathrin U. Jansen and Gary Zlotnick. (2008) Prediction of Broad Vaccine Coverage for a Bivalent rLP2086 Based Vaccine Which Elicits Serum Bactericidal Activity Against a Diverse Collection of

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1. Antigen-Specific IgE regulation by interferon-gamma *in vivo*. *7th International Congress of Immunology*, Berlin, FRG. August 3, 1989.
2. Presence of CD23 mRNA in B cells not expressing the low affinity Fc□R (CD23). *Annual IgE Dinner at Federation of American Societies of Experimental Biology*, Los Angeles, CA., May 1992.
3. Regulation of CD23 expression during B cell ontogeny. *Annual IgE Dinner at Federation of American Societies of Experimental Biology*, Denver, CO., May 1993.
4. Identification and characterization of Fc□RIII-□, Fc□RII b-1/b-2, CD3-□, and Fc□R1-□-chains in murine B cells. *Federation of American Societies of Experimental Biology Summer Research Conference*, Saxtons River, VT., July 1993.
5. Developmental regulation of Fc□RII/CD23 expression in B-lineage cells: Evidence for transcriptional and post-transcriptional levels of control. *8th Symposium on Signals and Signal Processing in the Immune System*, Kecskemet, Hungary, September 1994.

**Patent Applications/Filings:**

1. "Adjuvant Combination Formulations I"
2. "Adjuvant Combination Formulations II"
3. "Mutant Cholera Holotoxin as an Adjuvant and an Antigen Carrier Protein"
4. "Formulations of Hydrophobic Proteins in an Immunogenic Composition Having Improved Tolerability"

5. "Active Immunization to Generate Antibodies to Soluble A-beta"